**ORIGINAL PAPER**

# The role of daily need crafting in daily fluctuations in adolescents' need-based and affective experiences

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## Abstract

Based on self-determination theory, this diary study examined associations between adolescents' daily need crafting and daily fluctuations in their need-based and affective experiences. We also examined the role of daily perceived autonomy-supportive parenting in adolescents' daily need-crafting. Adolescents ($N = 159$; $M_{age} = 15.56$; 62% female) filled out a diary for seven consecutive days. Multilevel path analyses indicated that need crafting varied on a day-to-day basis, with daily need crafting relating positively to daily positive affect and negatively to negative affect. The benefits of daily need crafting were accounted for by higher daily need satisfaction and lower need frustration. Further, on days adolescents perceived more parental autonomy support, they reported more need satisfaction and less need frustration, an effect that was partially due to higher need crafting that day. Overall, the results suggest that need crafting represents a critical pro-active skill, with resulting benefits for adolescents' daily need-based experiences and well-being.

## Introduction

Adolescence is often portrayed as a developmental period of risk as adolescents are more vulnerable for the onset of mental health problems compared to children (Deković et al., 2004; Zahn-Waxler et al., 2000). Also, adolescents typically experience greater daily emotional fluctuations compared to children and adults (Arnett, 1999; Larson et al., 2002; Maciejewski et al., 2015). To explain these fluctuations in adolescents' affective experiences, it has been argued—based on self-determination theory (SDT, Deci & Ryan, 2000; Ryan & Deci, 2017)—that the basic psychological needs for autonomy, relatedness, and competence play an important role (Vansteenkiste et al., 2020). Research indeed confirms that adolescents feel more vital and happy on days their basic psychological needs are satisfied, whereas they experience more distress on days their needs are frustrated (Thomaes et al., 2017; van der Kaap-Deeder et al., 2017; Vandenkerckhove et al., 2019).

Given the important role of need-based experiences in adolescents' daily well-being, it is critical to identify the factors underlying these experiences. Extant research on the developmental origins of adolescents' need-based experiences has provided convincing evidence for the role of proximal socialization figures, such as parents and teachers (Soenens et al., 2017). Yet, in line with SDT's organismic-dialectical perspective (Deci & Ryan, 2002), adolescents are not just passive recipients of contextual influences. Instead, they can also pro-actively shape their own experiences and environment, thereby uplifting their own functioning (Vansteenkiste & Ryan, 2013). Recent cross-sectional and longitudinal research indeed suggests that adolescents can contribute to their own need-based experiences through *need crafting*, meaning that they pro-actively steer their lives to contexts and activities that facilitate need satisfaction and that lower need frustration (Laporte et al., 2021). The current study aims to examine whether the capacity for need crafting operates also at the level of adolescents' daily functioning and, more specifically, whether day-to-day differences in adolescents' need crafting predict daily variation in need-based and affective experiences. Further, this study

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attempts to gain insight into the role of daily autonomy-supportive parenting in adolescents' daily need crafting and subsequent daily need-based experiences.

## Need-based experiences and adolescents' psychological well-being

According to SDT, all individuals have three basic psychological needs, that is, the needs for autonomy, relatedness, and competence. These needs are considered universally important for individuals' mental health and behavioural adjustment (Ryan & Deci, 2017; Vansteenkiste et al., 2020). The need for autonomy refers to a sense of volition, authenticity, and psychological freedom. When experiencing autonomy, adolescents feel free to think, feel and act in a way they fully endorse. The need for relatedness concerns a sense of reciprocal care and closeness with important others. When the need for relatedness is fulfilled, adolescents feel connected and experience warm and secure relationships. The need for competence entails a sense of mastery and effectiveness. When experiencing a sense of competence, adolescents feel capable to perform activities and to face challenges effectively. Whereas the satisfaction of the three basic psychological needs is essential for psychological growth and well-being, the frustration of these needs hampers individuals' functioning and even increases risk for psychopathology (Vansteenkiste & Ryan, 2013). When the needs are frustrated, adolescents feel pressured or conflicted (i.e., autonomy frustration), excluded and lonely (i.e., relatedness frustration) and inferior and inadequate (i.e., competence frustration).

Consistent with SDT, a wealth of studies has shown that the basic psychological needs indeed play an important role in adolescents' psychosocial adjustment (Vansteenkiste & Ryan, 2013; Vansteenkiste et al., 2020). Adolescents reporting more need satisfaction were found to feel more energized and vital (Cordeiro et al., 2016), to report more positive affect (Rodríguez-Meirinhos et al., 2020) and life satisfaction (Leversen et al., 2012; Rodríguez-Meirinhos et al., 2020), and to be less susceptible to psychopathology (Emery et al., 2015; Véronneau et al., 2005). Adolescents experiencing more need frustration report more symptoms of stress (Campbell et al., 2017), negative affect (Bartholomew et al., 2011), and externalizing problems (Van Petegem et al., 2015). These effects have been documented across cultures (Chen et al., 2015) and across different life domains (e.g., friends, school; Milyavskaya et al., 2009).

Diary studies have shown that these need-based experiences also vary substantially on a daily basis within individuals (Mabbe et al., 2018; Reis et al., 2000; Ryan et al., 2010; Sheldon et al., 1996; van der Kaap-Deeder et al., 2019). Such diary studies are especially critical in adolescence as this developmental period is characterized by stronger

emotional ups and downs than in childhood and adulthood (Arnett, 1999, Larsen et al., 2002, Maciejewski et al., 2015). Previous diary studies confirmed that adolescents display substantial day-to-day variation in need-based experiences, and that daily need satisfaction relates positively to daily well-being (van der Kaap-Deeder et al., 2017), whereas daily need frustration relates positively to daily depressive symptoms (Vandenkerckhove et al., 2021), poor sleep via symptoms of stress (Campbell et al., 2020), and compensatory attempts to restore frustrated needs such as binge eating behaviors (Verstuyf et al., 2013). Because adolescence is characterized by emotional volatility and because the basic psychological needs appear to play an important role in these emotional ups and downs, an important next step for research is to investigate the sources of these daily fluctuations in adolescents' need-based experiences.

## Sources of adolescents' need-based experiences

From an SDT perspective it is argued that socialization figures can foster adolescents' need satisfaction by providing autonomy support, which includes the acknowledgement of adolescents' frame of reference, the provision of choice to foster exploration and independent decision-making, and offering a solid and meaningful rationale for requests. In line with these assumptions, research showed convincingly that autonomy-supportive practices by proximal socialization figures, such as parents (e.g., Soenens et al., 2017) and teachers (e.g., Jang et al., 2016), play an important role in adolescents' need-based experiences. Moreover, diary studies have begun to demonstrate that there is substantial daily variation in autonomy-supportive parenting, with these variations relating meaningfully to fluctuations in their offspring's need-based experiences (van der Kaap-Deeder et al., 2017).

Yet, adolescents are not just passively subjected to contextual variations. Consistent with SDT's organismic assumptions about human nature (Ryan & Deci, 2017), a few empirical studies have shown that individuals can proactively contribute to their own need-based experiences (Laporte et al., 2021; Legault, et al., 2017; Sheldon et al., 2010; Weinstein et al., 2016). To denote individuals' capacity to uplift their own need-based experiences, the term need crafting was coined (Laporte et al., 2021). Similar to the concept of job-crafting (i.e., employees' pro-active attempts to align their jobs with their own preferences and interests; Tims & Bakker, 2010; Wzresniewski & Dutton, 2001), need crafting refers to individuals' self-initiated attempts to seek and create optimal conditions for psychological need satisfaction to occur (Laporte et al., 2021; see also de Bloom et al., 2020). Specifically, individuals high on need crafting are aware of the activities, contexts and relational partners that are need-conducive for them (i.e.,

awareness component) and they use this self-knowledge to seek and create optimal circumstances to experience need satisfaction (i.e., action taking component). The capacity for need crafting is particularly important during adolescence, a developmental period in which individuals increasingly shape their own environment, thereby contributing to their own development (Ludeke et al., 2013; Soenens et al., 2019).

Initial cross-sectional and longitudinal research among adolescents provided evidence for the important role of need crafting in adolescents' need-based experiences and mental health (Laporte et al., 2021). First, this research showed that need crafting can be measured reliably and was related in a theory-consistent way with related constructs, such as mindfulness, pro-activity and asserted autonomy, testifying to the construct validity of the measure. Further, longitudinal analyses (spanning a 3-month period) demonstrated that need crafting related positively to adolescents' need-based experiences with these experiences, in turn, relating to more adolescent psychological well-being and less psychological ill-being, even when taking into account the role of adolescents' perceived need-supportive parenting (Laporte et al., 2021). Although these initial results provide evidence that adolescents' need crafting is a critical skill to optimize need-based experiences, the associations between need crafting and adolescents' need-based experiences may well be bidirectional in nature. It is indeed likely that need crafting needs to be energized, with experiences of need satisfaction freeing up the necessary energy such that adolescents can mobilize their need crafting skills. As this is one of the first studies targeting adolescents' capacity for need crafting, the current study primary focusses on the role of need crafting in adolescent' need-based experiences, thereby examining whether and how need crafting affects adolescents' need-based experiences.

The 6-month longitudinal study of Laporte et al. (2021), compromising three assessments, provided preliminary evidence for the notion that need crafting is a dynamic skill as about 35% of the variance in need crafting being situated at the level of within-person change. Yet, given that adolescents' need-based experiences are subject to faster daily fluctuations (Vandenkerckhove et al., 2019; Verstuyf et al., 2013), it remains to be examined whether their capacity for shaping their need-based experiences also fluctuates from day to day and whether daily need crafting contributes to adolescents' daily need-based experiences and subsequent affect.

### The role of autonomy-supportive parenting in need crafting

To date, need crafting and autonomy-supportive parenting have been treated as two rather independent sources of influence, yielding additive contributions to need satisfaction

(Laporte et al., 2021; Legault et al., 2017). Yet, in this study we address the possibility that the well-being benefits of autonomy-supportive parenting are partially due to its contributes to higher need crafting in adolescents. This possibility is in line with previous research and theory on the importance of parenting in other self-regulation strategies (e.g., emotion regulation, see Erdmann & Hertel, 2019). Because autonomy-supportive parents display a sincere interest in adolescents' interests and preferences, adolescents would more easily come in touch and become aware of them. Further, autonomy-supportive parents allow their adolescents the space for exploration choice, thereby encouraging them to make authentic decisions based upon their interests and preferences. Within such a climate, adolescents would experience the necessary room and freedom to craft their own opportunities for need-based experiences.

The current study is the first to examine whether the expected need-enhancing effect of daily autonomy-support can be accounted for by daily need crafting. Nevertheless, it should be noted that daily autonomy support may still yield a direct effect on adolescents' need-based experiences. This is because adolescents' basic needs may get directly fulfilled within the parent–child relation instead of being merely function of adolescents' attempts for need crafting, which presumably largely happens outside the parent–child dyad.

### The present study

The overall goal of the present study is to gain insight into the role of need crafting in adolescents' daily need-based experiences and psychological well-being. The first specific aim of this study was to investigate whether daily need crafting would relate positively to need satisfaction and negatively to need frustration, with these need-based experiences, in turn, relating to adolescents' daily affect (i.e., mediation). Congruent with the dual-pathway model in SDT (Costa et al., 2016; Haerens et al., 2015; Vansteenkiste & Ryan, 2013) we expected need satisfaction to relate primarily to positive affect, whereas need frustration was expected to relate primarily to negative affect (Hypothesis 1). The second aim was to examine daily autonomy-supportive parenting as a potential antecedent of adolescents' daily need crafting and subsequent daily need-based experiences. We expected that daily autonomy-supportive parenting would relate indirectly to higher daily need satisfaction and lower daily need frustration, with daily need crafting partially mediating these associations (Hypothesis 2).

### Method

#### Participants and procedure

The data presented in this paper are part of a broader multi-informant diary study involving adolescents and either

their mother or father. In this manuscript, we relied only on adolescents' reports. In total, 159 Dutch-speaking Belgian adolescents ($M$ age = 15.56 years, SD = 1.14, range = 13–18; 61.49% female) participated in this 7-days diary study. Of all participants, 57.76% followed an academic track, 35.40% a technical track and 4.35% a vocational track. The majority of the parents were either married or living together (81.40%), with the other parents being divorced, single, or widowed. Although initially 161 adolescents participated to the study, two adolescents who did not fill out the diary were removed from the dataset.

In the context of a course on developmental psychology, undergraduate students were asked to recruit participants by contacting a family (who were not relatives of the student) with at least one adolescent in the 9th, 10th, 11th or 12th grade of secondary school. To obtain heterogeneity in terms of educational track, students were instructed to recruit an adolescent following a specific track (academic track or technical/vocational track). Also, half of the students were instructed to ask participants to report on the parenting practices of their mother and half of the students were instructed to ask participants to report on the parenting practices of their father. Students were trained to approach potentially interested families and to collect data during an information session with the fifth author of this study. Further assistance during the data collection was provided to the students via e-mail. We chose to work with students as main recruiters, because the collection of a large sample of adolescents who were motivated to keep a diary requires a personal approach. During a home visit, students assisted adolescents to fill out our online baseline questionnaire and explained how to fill out the online questionnaires on a computer or smartphone. The participants were instructed to fill out the diary questionnaires every evening during seven consecutive days of a regular school week in November 2019, starting from Saturday. Each day, items were administered in the same order. Text messages were used as reminder to fill out the questionnaires. Participation was anonymous and voluntary. Both adolescents and one of the parents gave their written consent for the participation. Approval to conduct this study was obtained from the faculty's Ethical Committee (2019/71).

## Measures

### Daily need crafting

Each day, participants filled out a set of 12 items from the Dutch version of the need crafting scale (NCS: Laporte et al., 2021), which were slightly adapted to make them amendable for a diary format. The internal structure of this scale was established through Confirmatory Factor Analysis and its validity was documented through theoretically plausible associations with related constructs and personality

variables (Laporte et al., 2021). There were 4 items to measure the crafting of each of the three needs. Within each of the needs, there were 2 items tapping into the awareness component (e.g., *"Today, I knew well which people really care about me"*, need for relatedness) and 2 items tapping into the action component (e.g., *"Today, I deliberately chose to do activities I am good at"*, need for competence). Items were rated on a 5-point Likert scale, ranging from 1 (*completely not true*) to 5 (*completely true*). Cronbach's alpha for need crafting was 0.83 on the within-person level and 0.95 on the between-person level.

### Daily need-based experiences

Daily need satisfaction and frustration were assessed through a Dutch version of the 12-item version of the well-validated basic psychological need satisfaction and need frustration scale for children (BPNSNF: Chen et al., 2015; van der Kaap-Deeder et al., 2015). There were two items for satisfaction and two items for frustration of each of the three needs. Items were scored on a 5-point Likert scale, ranging from 1 (*completely not true*) to 5 (*completely true*). A sample item for need satisfaction (6 items) was *"Today, I felt free to choose which activities I did"* (i.e., autonomy satisfaction). Cronbach's alpha for need satisfaction was 0.69 on the within-person level and 0.91 on the between-person level. A sample item for daily need frustration (6 items) was *"Today, I often had doubts about whether I'm good at things"* (i.e., competence frustration). Cronbach's alpha for need frustration was 0.60 on the within-person level and 0.88 on the between-person level.

### Daily positive and negative affect

To tap into adolescents' daily positive and negative affect, participants completed the positive and negative affect scale (PANAS: Watson et al., 1988). Both the positive affect (e.g., *"enthusiastic"*) and the negative affect scale (e.g., "*sad"*) included 10 emotions scored on a 5-point Likert scale, ranging from 1 (*experienced very little or not at all*) to 5 (*experienced very often*). Cronbach's alpha for daily positive affect was 0.76 on the within-person level and 0.90 on the between-person level, whereas for daily negative affect Cronbach's alpha was 0.72 on the within-person level and 0.92 on the between-person level.

### Daily autonomy-supportive parenting

Participants were asked to fill out each day six items assessing daily perceived autonomy-support of their father or mother. Each day, participants reported on the parenting practices of the same parent. Items were selected from the Dutch version of the perceived parental autonomy support

**Table 1** Descriptive statistics and correlations between day-level and person-level variables

|  | M | SD | α | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|---|---|---|---|
| 1. Need crafting | 3.71 | 0.74 | 0.87–0.91 |  | 0.87*** | − 0.46*** | 0.58*** | − 0.39*** | 0.47*** |
| 2. Need satisfaction | 3.82 | 0.68 | 0.76–0.81 | 0.55*** |  | − 0.62*** | 0.57*** | − 0.54*** | 0.52*** |
| 3. Need frustration | 2.13 | 0.75 | 0.72–0.79 | − 0.32*** | − 0.51*** |  | − 0.20⁺ | 0.80*** | − 0.22*** |
| 4. Positive affect | 3.02 | 0.77 | 0.79–0.84 | 0.43*** | 0.54*** | − 0.32*** |  | − 0.14ⁿˢ | 0.23*** |
| 5. Negative affect | 2.16 | 0.79 | 0.79–0.85 | − 0.29*** | − 0.33*** | 0.40*** | − 0.35*** |  | − 0.12ⁿˢ |
| 6. Autonomy-support | 5.27 | 0.76 | 0.69–0.83 | 0.27*** | 0.30*** | − 0.17*** | 0.24*** | − 0.18*** |  |

Correlations on the within-person level are reported under the diagonal, correlations on the between-person level are reported above the diagonal

***$p < 0.001$

**$p < 0.01$

*$p < 0.05$

⁺$p < 0.10$ⁿˢ

## Plan of analysis

To investigate the main hypotheses, multilevel path analyses were performed in MPlus 8.4. As a first step, we calculated intra-class correlations (ICC) by building random intercept-only models (1) to document the daily variability in need crafting and (2) to examine if multilevel modelling was appropriate. These models disaggregate the total variation in the data into between-person level variation (variance due to differences between individuals) and within-person level variation (variance due to differences over time). Second, to investigate Hypothesis 1 (which assumes an intervening role of adolescents' need-based experiences in associations between need crafting and daily affect), we performed a multilevel mediation model, thereby testing the hypothesized structural model at the within-person level and controlling for this model at the between-person level. Third, to investigate the possibility that daily parenting would relate indirectly to need-based experiences through need crafting, we conducted a second multilevel model, including perceived autonomy-supportive parenting as independent variable and including need crafting as intervening variable and need-based experiences as outcomes. Similar to the approach in Hypothesis 1, we controlled for associations on the between-person level by performing the hypothesized model simultaneously at the within-person level and between-person level.

scale for adolescents (P-PASS: Mageau et al., 2015) and were adopted in a diary format. An example item was "*Today, my mother/father gave me many opportunities to make my own decisions about what I wanted to do*". Participants were asked to rate the items on a 7-point Likert scale, going from 1 (*completely incorrect*) to 7 (*completely correct)*. Cronbach's alpha for perceived autonomy-supportive parenting was 0.66 on the within-person level and 0.86 on the between-person level.

## Results

### Descriptive statistics and preliminary analyses

Table 1 shows means, standard deviations and correlations of all study variables. To examine the associations between the background variables (i.e., gender, age, family structure and education level) and the study variables, we conducted a multilevel model with the background variables as between-person variables and with the main study variables as dependent variables. There were no significant effects of adolescents' type of education on the study variables. However, we found significant effects of gender on need crafting ($b = − 0.31$, $SE = 0.088$, $p < 0.001$), need satisfaction ($b = − 0.26$, $SE = 0.080$, $p < 0.01$), need frustration ($b = 0.25$, $SE = 0.092$, $p < 0.01$), positive affect ($b = − 0.22$, $SE = 0.088$, $p < 0.05$) and negative affect ($b = 0.28$, $SE = 0.100$, $p < 0.01$), with boys reporting significantly more need crafting, need satisfaction and positive affect and lower need frustration and negative affect compared to girls. Furthermore, we found a significant effect of adolescents' age on need crafting ($b = − 0.15$, $SE = 0.040$, $p < 0.01$), need frustration ($b = 0.09$, $SE = 0.040$, $p < 0.05$) and negative affect ($b = 0.08$, $SE = 0.041$, $p < 0.05$), with older adolescents reporting lower need crafting as well as higher need frustration and negative affect. Also, we found a significant effect of family structure on perceived daily autonomy-supportive parenting ($b = − 0.69$, $SE = 0.176$), $p < 0.001$), with adolescents living in an intact family reporting higher daily autonomy support compared to adolescents living in a non-intact family (e.g., divorced parents, deceased parent(s)). Based on these results, we decided to control for adolescents' gender, age and family structure in all subsequent analyses.

Also, regarding the assessment of daily perceived autonomy support, 60.20% of the participants reported on their mother's use of autonomy support and 39.80% of the participants reported on their father's use of autonomy support.

**Fig. 1** Within-person level results of a multi-level mediation model of daily need crafting on daily affective experiences through daily need-based experiences
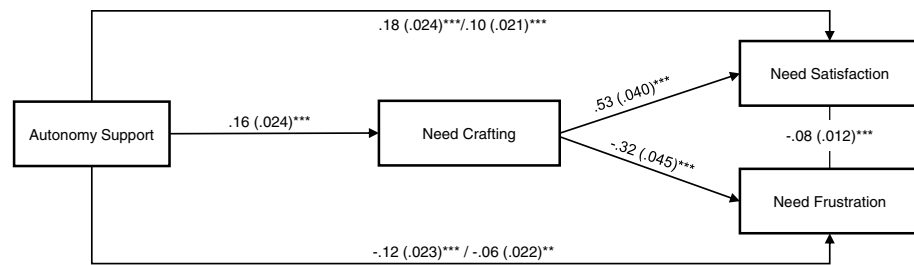


*Note.* Coefficients shown are unstandardized path coefficients with standard errors reported between brackets. ;

direct effects after adding need-based experiences are reported after the slash "/", original direct effects are reported

before the slash "/"; *** $p < .001$. ** $p < .01$. * $p < .05$

Although an independent sample t-test indicated that the mean rating of perceived paternal and maternal autonomy support was not significantly different [$t(157) = 0.22$, $p = 0.83$], parents' gender was added as a control variable in all models including perceived daily autonomy support.

Furthermore, we calculated the intra class correlation (ICC) to examine the daily variability of need crafting. The ICC value indicated that 53% of the variance in need crafting reflects between-person variance. This percentage implies that a substantial part of the variance (i.e., 47%) is also situated at the within-person level. It should be noted that the variance at the within-person level also includes error variance. Still, this result suggests that need crafting does not only differ between individuals, but also varies within adolescents on a day-to-day basis. Additionally, we found daily variability in all other constructs. The ICC's were 0.46 for need satisfaction, 0.52 for need frustration, 0.45 for positive and 0.53 for negative affect, and 0.55 for autonomy-supportive parenting. Given the substantial variation in these key constructs at the within-person level (above 0.05, Preacher et al., 2010), the data were deemed suitable for multilevel modelling.

### Primary analyses

#### Aim 1: need crafting, daily need-based experiences, and daily negative affect

Results of a fully saturated multilevel model testing Hypothesis 1 are shown in Fig. 1. As can be seen, daily need crafting relates positively to daily need satisfaction, which in turn relates positively to daily positive affect and negatively to negative affect. Additionally, daily need crafting related negatively to daily need frustration which, in turn, related positively to negative affect but was unrelated to positive affect. The indirect associations between need crafting and positive affect via need satisfaction ($b = 0.26$; $SE = 0.033$, $p < 0.001$) and negative affect via both need satisfaction

($b = -0.08$; $SE = 0.028$, $p < 0.01$) and need frustration ($b = -0.10$; $SE = 0.020$, $p < 0.001$) were all significant. Moreover, after taking into account the intervening role of adolescents' need-based experiences, there were still significant direct associations between need crafting and both positive and negative affect (see Fig. 1).[1]

#### Aim 2: the role of daily autonomy-supportive parenting in need crafting

We tested a multilevel model in which daily perceived autonomy support was related to adolescents' need crafting efforts that, in turn, were related to adolescents' need-based experiences. This fully saturated model, which was tested at the within-person level, also included direct associations between autonomy support and need-based experiences. As shown in Fig. 2, perceived daily autonomy-supportive parenting related positively to daily need crafting. In turn, daily need crafting was related positively to daily need satisfaction and negatively to daily need frustration. The indirect pathways between perceived daily autonomy-supportive and

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[1] Although we focused in the main analyses on need crafting as an overall construct, we also explored how daily fluctuations in the subcomponents of need crafting (i.e., awareness component and action taking component) are uniquely related to daily fluctuations in adolescents' affective experiences, through their need-based experiences. To do so, we re-estimated the multilevel path analyses of Hypothesis 1 separately for each of the subcomponents. The findings obtained with the overall score were largely analogous to the findings obtained with the separate scores for awareness (CFI = 1.00; RMSEA = 0.03; SRMR on the within-person level = 0.00) or action taking (CFI = 1.00; RMSEA = 0.03; SRMR on the within-person level = 0.00). The results indicated that both daily awareness ($b = 0.49$; $SE = 0.051$, $p < 0.001$) and action taking ($b = 0.43$; $SE = 0.035$, $p < 0.001$) relate positively to need satisfaction, which in turn relates to more positive affect (model 1: $b = 0.50$; $SE = 0.046$, $p < 0.001$; model 2: $b = 0.48$; $SE = 0.050$, $p < 0.001$) and less negative affect (model 1: $b = -0.15$; $SE = 0.049$, $p < 0.05$; model 2: $b = -0.16$; $SE = 0.049$, $p < 0.01$). Further, awareness ($b = -0.29$; $SE = 0.047$, $p < 0.001$) and action ($b = -0.26$; $SE = 0.037$, $p < 0.001$) each related negatively to need frustration which, in turn, relates

**Fig. 2** Within-person level results of a multi-level mediation model of daily autonomy support on daily need-based experiences through daily need crafting
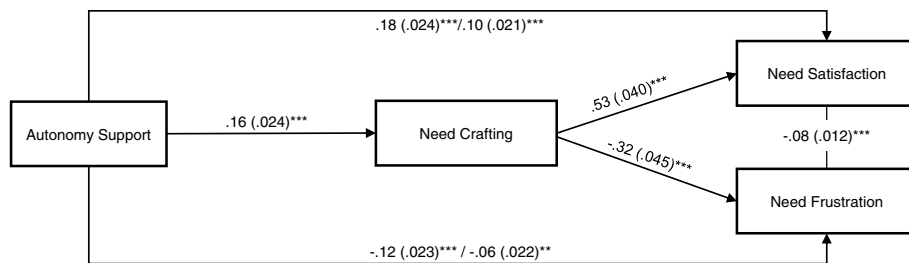


*Note.* Coefficients shown are unstandardized path coefficients with standard errors reported between brackets. ;

direct effects after adding need-based experiences are reported after the slash "/", original direct effects are reported

before the slash "/"; *** $p < .001$.** $p < .01$.* $p < .05$

daily need satisfaction ($b = 0.09$; $SE = 0.015$, $p < 0.001$) and daily need frustration ($b = -0.05$; $SE = 0.011$, $p < 0.001$), through daily need crafting were significant. As anticipated, the direct associations between perceived daily autonomy support and need-based experiences remained significant after taking into account the indirect associations through need crafting.

## Supplementary analyses

In a series of supplementary analyses, we examined in greater detail the direction of effects in the association between need crafting and adolescents' need-based experiences. First, we tested an alternative mediation model in which adolescents' daily need-based experiences were included as predictors of adolescents' daily need crafting, which related to daily affect. To facilitate a comparison between the original and this alternative sequence, we tested both models without allowing direct associations between the independent variable and dependent variable in the models. To compare these non-nested models, we relied on the Akaike information criterion (AIC; Akaike, 1974) and Bayesian information criterion (BIC; Schwarz, 1978)

fit indices, with lower values indicating a better fit. Results favoured the original sequence (i.e., AIC = 8184.78 and BIC = 8412.380 for the original sequence; AIC = 8557.264 and BIC = 8720.61 for the alternative sequence).

In a second series of analyses, we tested a multilevel path model in which adolescents' need crafting and need-based experiences on a given day predict, respectively, adolescents' need-based experiences and need crafting the next day after controlling for the corresponding constructs on the previous day. Results of this fully-saturated model are shown in Fig. 3. As can be seen, adolescents' daily need crafting related positively to need satisfaction the next day but not vice versa. This effect emerged after controlling for within day associations between need crafting and need-relevant experiences.

## Discussion

Recent diary-based research increasingly shows that the basic psychological needs (i.e., autonomy, relatedness and competence) play a key role in individuals' emotional ups and downs (e.g., van der Kaap-Deeder et al., 2017; Vandenkerckhove et al., 2019). This dynamic role of need-based experiences in daily well-being is primarily relevant in adolescence, a developmental period characterized by stronger emotional fluctuations compared to other developmental periods (Arnett, 1999; Larsen et al., 2002; Maciejewski et al., 2015). From an SDT-perspective, adolescents' need-based experiences are likely affected by a complex interplay of both contextual and intrapersonal sources of influence (Ryan et al., 2019). Yet, previous research has mainly focused on the role of socializing agents, such as parents (van der Kaap-Deeder et al., 2017), at the expense of a focus on adolescents' agentic contribution to their own daily need-based experiences. Therefore, the goal of this study was to investigate the role of need crafting in adolescents' daily emotional ups and downs, through fluctuations

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Footnote 1 (continued)

positively to negative affect (model 1: $b = 0.31$; $SE = 0.044$, $p < 0.001$; model 2: $b = 0.31$; $SE = 0.044$, $p < 0.001$) and which is unrelated to positive affect. All indirect associations were significant. Also, after taking into account the intervening role of adolescents' need-based experiences, there were still significant direct associations between the subcomponents of need crafting and both positive affect (model 1: $b = 0.14$; $SE = 0.037$, $p < 0.001$; model 2: $b = 0.17$; $SE = 0.042$, $p < 0.001$) and negative affect (model 1: $b = -0.11$; $SE = 0.035$, $p < 0.01$; model 2: $b = -0.08$; $SE = 0.037$, $p < 0.05$). These findings suggest that both the awareness and action taking components were related to adolescents' need-based experiences and affective experiences. However, more research is necessary to gain more insight in the interplay between both components and how they relate to adolescents' mental health.

**Fig. 3** Within-person level
results of a multi-level model
including cross-lagged pathways
between daily need crafting and
daily need-based experiences
across days
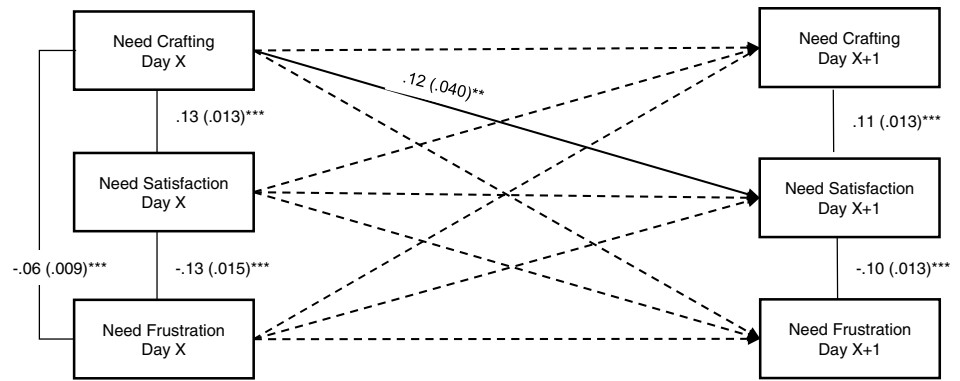


*Note.* Coefficients shown are unstandardized path coefficients with standard errors

reported between brackets; *** $p < .001$. ** $p < .01$. * $p < .05$

in daily need-based experiences. Additionally, we aimed to examine the role of daily autonomy-supportive parenting in adolescents' need-crafting efforts and subsequent need-based experiences.

## The benefits of daily need crafting

The first aim of the present study was to examine whether adolescents would benefit from daily need crafting in terms of the quality of their daily affect. A first observation was that need crafting fluctuates considerably throughout the period of a week. More specifically, about half of the variance in need crafting was situated at the level of daily (within-person) variation. Although considerable inter-individual differences between adolescents exist, with some adolescents engaging more often in need crafting than others, adolescents also vary from day to day in their use of need crafting. Further, as hypothesized, we found that on days adolescents engaged more in need crafting, they experienced both more positive affect and less negative affect. This is an important finding, because it indicates that adolescents' efforts to organize their daily life around opportunities for need satisfaction, go hand in hand with both more frequent emotional ups and less frequent emotional downs. In sum, these findings build on the current literature by showing that need crafting plays an important role in diverse facets of adolescents' mental health. In addition to the role of need crafting in nurturing adolescents' global psychological well-being and avoiding the onset of psychological problems (Laporte et al., 2021), the current study showed that need crafting may also be critical to prevent adolescents from experiencing high emotional oscillations, a phenomenon characteristic of adolescents' mental health (e.g., Larson et al., 2002).

Furthermore, daily need crafting was associated indirectly with adolescents' daily affect through its associations with daily need-based experiences. Consistent with the dual-pathway model (Vansteenkiste & Ryan, 2013) and previous longitudinal research (Laporte et al., 2021), need satisfaction primarily related to positive affect, while need frustration related primarily to negative affect. Moreover, need frustration yielded no significant relation with positive affect, whereas need satisfaction yielded a (small) negative relation with negative affect. These results suggest that the absence of need frustration is insufficient to feel well and vital, whereas experiences of need satisfaction partly protect against adolescents' psychological problems.

Even when taking into account the intervening role of adolescents' need-based experiences, there was still a direct association between daily need crafting and high-quality affect. This finding raises the possibility that need crafting is directly beneficial for adolescents' well-being or that additional mediators, such as individuals' attentional focus (e.g., Jacobson et al., 1996; Krings et al., 2020) or vitality (e.g., Çelik, 2017), play a role in these associations. Another possibility, however, is that these remaining direct associations reflect an opposite direction of effects, with adolescents feel more energetic and vital to engage in need crafting on days they experience higher positive affect. To shed preliminary light on the bidirectional associations between need crafting and need satisfaction, we performed two series of additional analyses, thereby examining an alternative sequential model (need-based experiences → need crafting → affect), as well as the question whether need crafting predicts improved need satisfaction the next day or, vice versa, whether need satisfaction energizes increased need crafting the next day. Both sets of findings are in favour of the hypothesis that primary need crafting predicts experiences of need satisfaction rather than the other way around. Yet, we hasten to say

that this is just the first study that sheds light on the issue of bidirectionality. To further examine this through diary studies, assessment of need crafting and need-relevant experiences may be taken on distinct moments of the day instead of concurrently, as was the case herein. For instance, future research could ask adolescents to report on need crafting in the morning and on their need-based experiences through an experience sampling method across the day. The time lag between both measures would allow one to examine whether morning need crafting intentions drive need-relevant experiences. Ideally, these assessments would be done over a period of at least one month, as adolescents' weeks differ considerably due to several factors, such as the workload in school. As also diary studies are correlational in nature, only experimental research would allow one to draw more conclusive answers regarding direction of effects. Adolescents could be guided through a need-crafting intervention, which strengthen their skill for need crafting, as to examine whether induced need crafting allows adolescents to optimize their need-experiences compared to individuals in a control group. An on-line intervention study among the broader population provided initial promising evidence for this direction of effects (Laporte et al., 2022). Yet, adolescents' needs could also be contextually supported as to examine whether enhanced need satisfaction fosters greater need crafting compared to adolescents placed in a control group.

## The role of autonomy-relevant parenting in adolescents' need crafting

The second aim of this study was to examine the role of daily autonomy-supportive parenting in adolescents' need crafting and subsequent need-based experiences. As expected, we found that on days adolescents experienced higher autonomy support, they reported more need crafting. In turn, need crafting partially accounted for the association between daily autonomy-supportive parenting and adolescents' need-based experiences. Consistent with findings regarding other capacities for self-regulation domains (i.e., emotion-regulation; Brenning et al., 2015; Erdmann & Hertel, 2019), these findings suggest that through autonomy-supportive parenting, parents can enhance adolescents' self-regulation capacities. Similar to the co-regulation of emotions (Erdmann & Hertel, 2019), parents can strengthen adolescents' need crafting skills by gradually guiding them during their need crafting attempts, so they become more and more independent in crafting their own needs. For instance, in early childhood, parents can foster children's daily awareness towards their own psychological needs by naming and mirroring (Gottman et al., 1997; Yap et al., 2008) the emotions that children experience when engaging in need-satisfying activities, thereby making children aware of experiences of autonomy,

relatedness and competence during these events. Also, parents can more indirectly stimulate children's awareness towards their need-based experiences, by encouraging them to broadly explore their own needs independently, enabling them to make authentic decisions and to select activities, contexts and relational partners that give rise to more need satisfaction [i.e., *fostering inner-directed valuing processes* (FIV); Assor, 2012; Assor et al., 2020]. Further, parents can encourage children to engage in need-satisfying activities, by providing room to explore and try out diverse activities that may be need congruent for them. Although the current results generally suggest that autonomy-supportive parenting is indeed beneficial for adolescents' daily need crafting efforts, more research in different age groups is needed to explore developmentally sensitive manifestations of autonomy support in relation to need crafting, including constructs such as co-regulation. Also, as adolescents spend five out of the seven days per week in school, not only parents, but also teachers and peers, are likely to affect adolescents' daily need crafting attempts. Future research could therefore include several contextual sources, thereby relying on a combination of adolescent self-report and other-report measurements.

Important to note is that need crafting mediated only partially the relation between daily autonomy-supportive parenting and daily need-based experiences, thereby suggesting that autonomy-supportive parenting is directly relevant for adolescents' need-based experiences. Also, it is likely that alternative mediating mechanisms playing an intervening role in these relations, such as adolescents' capacity for emotion regulation and identity development, which are known to be fostered by an autonomy-supportive parenting style (Assor et al., 2020; Brenning et al., 2015).

In addition to further get better insight in specific parenting practices and their impact on adolescents' daily need crafting attempts,, future research would also do well to examine the interactive interplay between daily autonomy-supportive parenting and need-crafting. One possibility is need crafting efforts of adolescents yield more pronounced benefits when parents are perceived as autonomy-supportive. Autonomy-supportive parents may reinforce the effects of need crafting by for instance, naming and acknowledging the pleasure and satisfaction adolescents derive from their need crafting. Alternatively, need crafting could be especially critical for adolescents' well-being on days they experience a lack of parental autonomy support. Need crafting may on such days help to compensate the lack of contextual need support they experienced that day (Legault et al., 2017).

## Limitations and directions for future research

A first limitation has to do with the generalizability of our findings. On the one hand, participants were recruited

through undergraduate students in the context of a course on developmental psychology. Because of this approach, the participants' characteristics are likely to have resembled the sociodemographic background of the students. We tried to ensure heterogeneity in terms of education level by asking students to recruit an adolescent following a prescribed track. Nevertheless, adolescents were relatively highly educated and more intact families and more girls participated to the current study compared to the Flemish sample (Statistiek Vlaanderen, 2021). Also, there were no families with an immigration background.[2] Future research is needed to replicate these findings among families from more diverse sociodemographic and cultural backgrounds. On the other hand, in order to increase the generalizability of our findings over time, further studies could re-conduct the current study during Summer Holidays, a period in which adolescents experiencing generally more freedom and opportunities to engage in need crafting. One possibility is that need crafting is more fruitful during holidays, given adolescents can freely seek for activities and interactions that fully fit their interests and needs.

Second, by using larger and more heterogeneous samples future research could also attempt to gain more insight in the gender differences and age-related trends observed in this study. Indeed, it was remarkable that boys reported significantly higher levels of need crafting compared to girls. This finding can be explained from a socialization perspective, according to which boys often get more freedom and room for independence than girls, allowing them to broadly explore their needs and to organize their daily life around need-satisfying activities and contexts. With regard to age, our results showed that need crafting was related negatively to adolescents' age. This finding contradicts to previous findings in other self-regulation domains (e.g., emotion regulation), indicating that from middle to late adolescence, adolescents become more skilled to regulate their emotions(e.g., Zimmerman & Iwanski, 2014), thereby using more adaptive and less maladaptive emotion-regulation strategies at the end of adolescence (i.e., 16–18 years), compared to middle adolescence (i.e., 12–15 years).Yet, as adolescents spend more time in school and as academic expectations increase during adolescence, adolescents may have less leisure time available to freely choose their own activities. Future research could address this possibility by including a wider age range and by including context-specific measures of need crafting, distinguishing need crafting in school and leisure time.

Third, the measures for daily satisfaction and frustration of the needs had modest reliabilities at the within-person level. Therefore, the findings obtained with these scales should be interpreted with some caution. These modest internal consistencies at the within-person level indicate that the different items in each of the scales that tap into need satisfaction and need frustration do not necessarily co-occur on the same day. For instance, even when an adolescent feels a sense of choice and freedom in the things he or she did on a given day (i.e., autonomy satisfaction), he or she may not necessarily feel competent to achieve his goals (i.e., competence satisfaction) on that given day.

## Conclusion

The current study provided further evidence for the role of need crafting in adolescents' daily emotional ups and downs. Moreover, although the current design does not allow us to make any causal claims, this study is the first study to suggest that parents can contribute to adolescents' need crafting skills by using more autonomy-supportive parenting strategies. Conversely, controlling parenting strategies were related to lower engagement in need crafting. Overall, these findings have potential implications for prevention and for interventions targeting adolescents' need-based experiences. Most need-based interventions focus on socialization figures in adolescents' life (parents and teachers), thereby teaching adults to nurture children's need-based experiences. Yet, a two-track approach is perhaps to be preferred, including a parent-program to enhance parents' skills to uplift their child's need crafting capacities and an adolescent-program to strengthen more directly adolescents' need crafting capacities.

**Data availability** The data that support the findings of this study are openly available in Open Science Framework at https://doi.org/10.17605/OSF.IO/YH8R6.

## Declarations

**Conflict of interest** The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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[2] Specifically, in the Flemish population: 42.9% of the adolescents follows an academic track, 48.8% of the adolescents is female, 9.5% of the families has an immigration background and 71.0% of the families is intact (Statistiek Vlaanderen, 2021).

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